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AN EVALUATION OF THE FOREST AND RANGELAND RENEWABLE RESOURCES OF IDAHO

Intermountain Forest & Range Experiment Station

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STUDY PLAN NO. 4101-1-1.6.0

AN EVALUATION OF THE FOREST AND RANGELAND RENEWABLE RESOURCES OF IDAHO

Map Point Classification Procedures

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

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Map Point Classification Procedures

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MAP POINT CLASSIFICATION ... IDAHO

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Map Point Classification Procedures

I. INTRODUCTION

The following map point classification procedures (MPC) were developed as a component set of data for forest and range resource inventories.

The MPC data are the noninterpretive data needed for primary samples in a two-phase statistical sampling design. Data from aerial photo interpretation or other remote sensor source are usually combined with the MPC data to complete the primary sample data file.

Much of the MPC data are available on maps and will not change over time; i.e., slope, elevation, geographic location. Other data, such as ownership, may change over time and may include items of interpretive information which have been mapped.

By separating the primary sample data into interpretive and noninterpretive groups, the two sets of information can be collected at different times, and by persons with different training or experience. The MPC data have been successfully collected by persons in the YACC and similar programs, while the interpretive information is usually collected by persons with scientific training.

These data sources are combined by computer and this combined primary sample is used with secondary field sample data, such as tree measurement and site classification data, to make estimates or tables of information describing resource characteristics in a particular area.

The MPC data described in the following procedures manual will create a data base over land areas which will be useful for future resource assessments, while meeting the specific needs of present studies. The data source is a systematic sample, which may be used with a number of alternative sampling designs, and by several agencies to meet various objectives. The data are also computer retrievable using the UTM grid system.

II. SUMMARY OF DATA COLLECTED

A. All map points in the working circle will be classified according to the basic 15 MPC variables which include 5 map location variables, 9 "description" variables, and the interpreter code.

These basic 15 data items will be recorded for every point within the working circle, regardless of ownership category or reserved category.

B. Map grid points not previously inventoried (by NFS), and not Census Water will be categorized by the other MPC variables.

III. DESCRIPTION OF THE COORDINATE SYSTEM

Sample points are located on maps by using the Universal Transverse Mercator System. The UTM Coordinate System is an internationally recognized military grid system. It is used between the latitudes of 80 degrees S. and 80 degrees N.

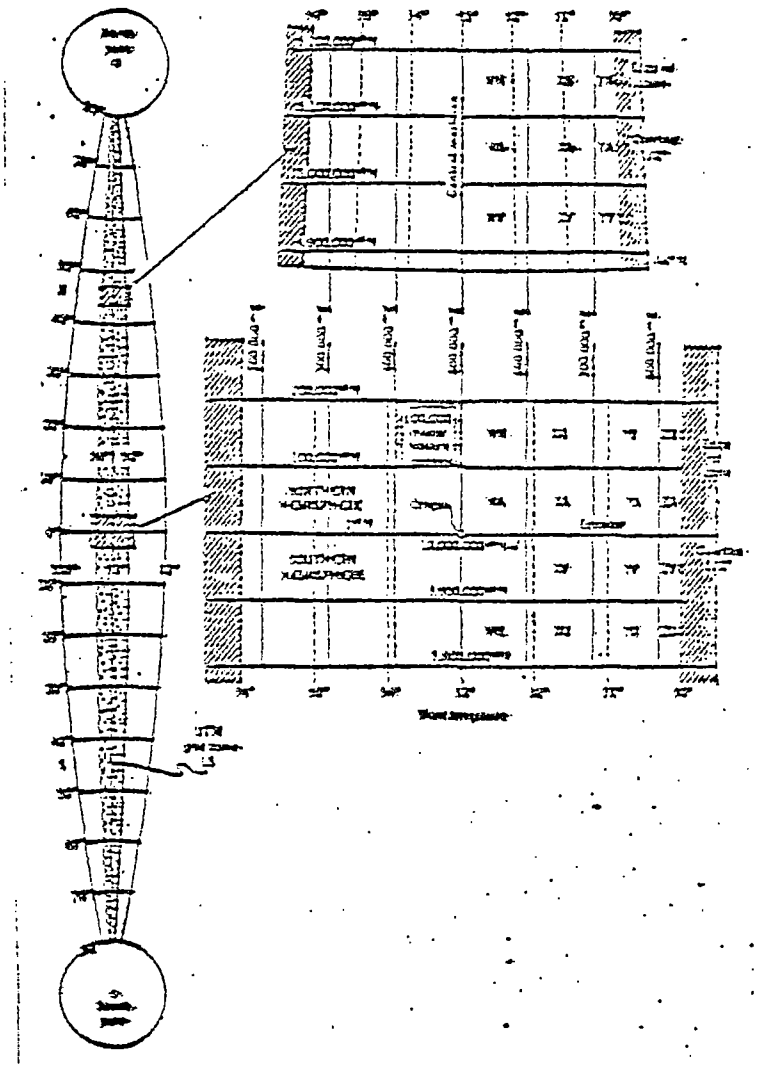
The UTM Grid System was chosen for sampling used by Resources Evaluation for several reasons:

1. It is a metric reference system.
2. It is currently found on most USGS quandrangle maps.
3. The grid points are equidistance throughout the grid zone, enabling us to locate sample points at a uniform spacing throughout an entire state.
4. It provides a standardized sampling frame thus enabling cooperating resource agencies to locate the sampling points without actually looking at our maps. This allows the collection of additional resource information by other agencies and provides for continuity in assessing trends and monitoring changes.

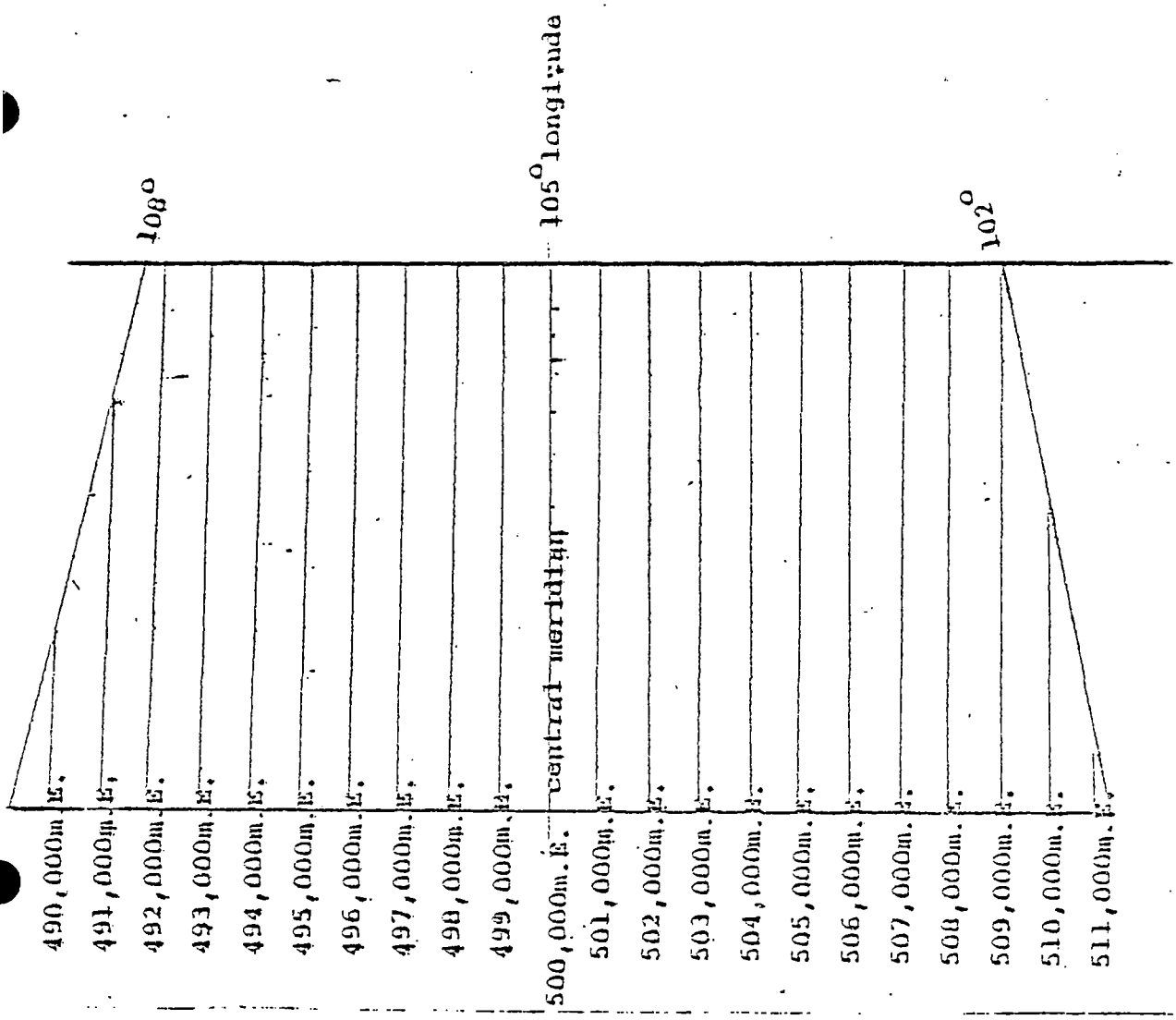
The UTM System uses the equator as a north-south baseline with grid lines being located at regular 1,000 meter intervals north of the equator. Thus, in the northern hemisphere, a given UTM Northing indicates the precise number of meters north of the equator where a sample point is located.

The UTM System is slightly more complicated on the east-west plane. The earth is divided into a series of designated grid zones, each 6 degrees longitude in width. The middle line of longitude is used as the east-west baseline in the grid zone. Grid lines are located parallel to this central line of longitude at 1,000 meter intervals east and west. Because lines of longitude are not parallel but converge at the poles, the grid lines will become increasingly divergent from the map edges as one nears a grid zone boundary.

Example of UTM Coordinate locations on the globe and on maps.



For reference purposes, grid lines are not designated as being east or west of the central meridian. Rather, the central meridian is given an arbitrary value of 500,000 m.E. The easting value of the grid lines decreases every 1,000 meters west of this meridian and increases every 1,000 meters east of the meridian until the grid zone boundary is reached.

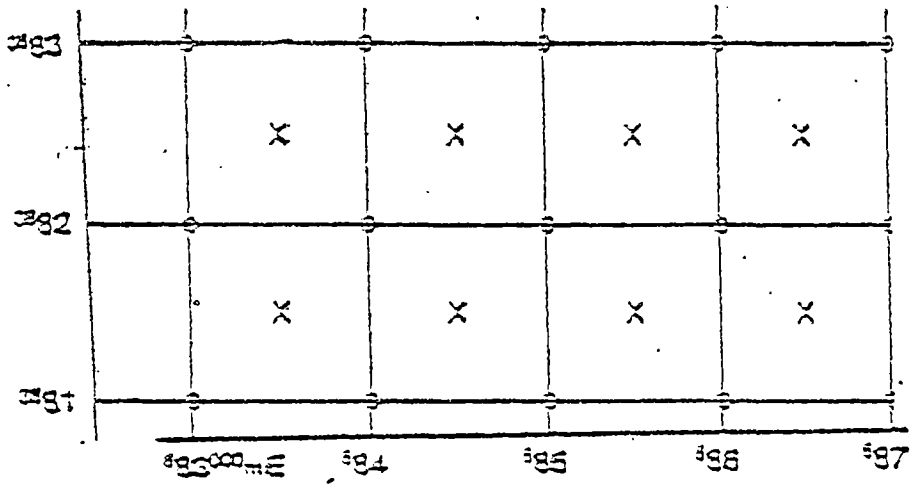


GRID ZONE

For example, any coordinates with values greater than 500,000 m.E. would be east of the central meridian. Likewise, any coordinates with values less than 500,000 m.E. would indicate points west on the central meridian. Using this system, it is necessary to know only three values (an easting, northing, and a grid zone number) to locate any point on the globe.

Primary sampling points are located on the map according to specified Universal Transverse Mercator coordinates. These points are often referred to as the photo interpretation (P.I.) sample. The sampling points are located at the intersection of every 1,000 m.E. and every 1,000 m.N., and also at the intersection of north and east coordinates ending with 500 meters.

For example, a row of points at 3,882,000 m.N. would be at such coordinates as 683,000 m.E.; etc. A row of points at 3,882,500 m.N. would be at coordinates 683,500 m.E.; 684,500 m.E.; 685,500 m.E.; etc. In all cases, there is a 1,000 meter interval between points north-south and east-west. Considering a 1,000 meter square within which to place points, the points are placed such that one is at each corner and one in the center, since the primary sample is actually composed of two 1,000 m. grids offset from each other one-half the interval (500 m.) both north and east.



Secondary samples (field locations) may be located at 5,000 m. intervals on both 1,000 m. primary sample grids described above. These two sets of 5,000 m. samples are also offset at one-half the interval north and east (2,500 m.). The first set of samples at 5,000 m. intervals on the even 1,000 m. grid is called the A grid, and the other grid is called the B grid. Field locations (supplemental) are usually added by selecting some of the other primary sample points. Usually, the secondary A grid is used with some supplemental samples.

IV. MAP GRIDDING

A. General

Map point classification (MPC) is one part of Phase I (Primary) sampling. It consists of classifying a set of sample points systematically spaced on USGS quadrangle maps according to categories of location, ownership, topographic position, political zone, and other mapped variables.

Two grids termed the primary A and the primary B grids are located on 7-1/2' quad maps (15' quad maps, if 7-1/2' quad maps are unavailable). The A grid is located with points spaced 1,000 meters apart, north and east, forming 1,000 meter x 1,000 meter squares. The B grid is located the same as A, but the starting point is offset 500 meters north and 500 meters east of a point on the A grid.

The primary A grid is located at the intersection of each 1,000 meter north and 1,000 meter east Universal Tranverse Mercator (UTM) coordinate line. These "lines" can be found as short blue tick marks along the edges of the maps. Connecting the tick marks forms the lines. Four of these A grid points form a square (1,000 x 1,000 meters). At the center of each of these "squares" is found the B grid point.

Prior to classification of grid points, the maps must be gridded; that is, the grid points are located and marked on the maps.

B. Map Gridding--A Grid

Primary sample points will be located at the intersection of lines connecting the UTM tick marks on the edges of the USGS quadrangle maps. These lines will be drawn using a fine tipped pencil. Care must be taken in connecting the tick marks so that lines are drawn to identical coordinates on each edge of the map. This is important as the UTM grid is not parallel to the map edges; that is, the first blue tick on the top of a map may not correspond to the first blue tick on the bottom. A similar problem often exists between the left and right edges of the maps.

The correct way to draw the UTM lines is to check the numerals beside the tick marks on the map edges, and draw the lines to connect tick marks of matching numerals. In the event that coordinate numerals are attached to only one tick mark on the map edge, the other coordinate numerals must be inferred. Remember, the coordinates increase by 1,000 meters for each blue tick going north and east.

Some quad maps may not have UTM coordinate tick marks. Prior to about 1943 the UTM System was not used on these maps. In such cases UTM's may be drawn on the maps be extending the coordinate system from a more recent adjacent map. Occasionally 3 or 4 maps in a row may not have UTM coordinates. In this case start with the first map adjoining a quad map which has UTM's printed on it. The quad maps do not overlap so the north-south lines can also be located from the adjacent side map by measuring the correct distance between ticks.

Now available is a computer program which will give the location of UTM tick marks as a distance (to the nearest .001 inch) from the map edge, and also, the numeral which should be attached to it. This will avoid tedious alignment of maps and trying to extend the UTM's from adjoining maps.

C. Map Gridding--Primary Grid B

The offset grid is to be located at the mid-points of the squares formed by connecting the UTM tick marks. These are located by using a film template laid over the 1,000 meter grid and marking the center point through the hole in the templates. The sample points will be located at the intersection of every north and east coordinate ending with 500 meters.

V. DEFINITION OF TERMS

ITEM 1 - STATE (Cols. 1 & 2)

Refer to the code list in the appendix for the proper code for the state in which the sample point falls.

ITEM 2 - (LEAVE BLANK) (Col. 3)

ITEM 3 - COUNTY (Cols. 4-6)

Refer to the code list in the appendix for the proper code for the county in which the sample point falls.

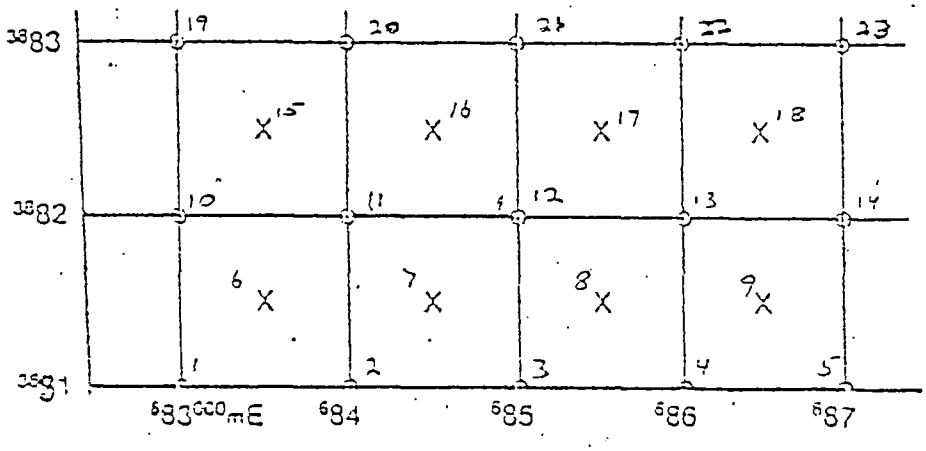
ITEM 4 - CONGRESSIONAL DISTRICT (Col. 7)

Congressional District is recorded to allow easy computer access to resource information in the event that this information is requested by one of the Congressman for their particular district. Refer to the code list in the appendix for the proper code for the congressional district in which the sample point falls.

ITEM 5 - CONSECUTIVE POINT NUMBERS (Cols. 8-11)

Consecutive point numbers will be written on the map during the preliminary stages of locating sample points.

Consecutive point numbers will be assigned to each grid point by individual map. They will begin with the number 1 being assigned to the first sample point on the lower left corner of the map. They will continue across the map left to right. The second row will begin again at the left edge of the map and continue to the right edge.



The consecutive point number will be recorded by the interpreter on the Map Point Classification Sheet to correspond to the correct UTM coordinates printed on the computer printout. The printout will be attached to the Map Point Classification Sheet. When two maps are used, consecutive point numbers must be identical on both maps.

Also the maps used for interpretation should be marked as a precaution against consecutive point number discrepancies.

MAP COORDINATE SHEET

Prior to recording any map data it will be necessary to complete the Map Coordinate Sheet. This will be used to prepare the Map Point

Classification Sheet, on which the interpreted data is recorded.

The Map Coordinate Sheet has coding spaces for listing the easting and northing UTM coordinates of each corner of a USGS map. These coordinates must be interpolated to the nearest 100 meters. They will be processed through the computer to print out the coordinates for every sample point of the map. These are then taped onto the Map Point Classification Sheets on which the sample point data will be recorded.

ITEM 6 - MAP NUMBER (Cols. 13-16)

Map numbering will be done on individual statewide quad map indexes.

1. The first step will be to divide unmapped areas on a map index into 7-1/2' sections. These will indicate where maps may be published in the future. (No more 15' maps are being published so there is no need to account for additional 15' coverage).

2. Map numbers will be assigned to each 7-1/2' section on the map index beginning with number "1" in the upper left-hand corner. Numbering will continue across the top row until the right-hand margin is reached at which time numbering drops to the next row and proceeds right to left. Numbering will continue by alternating left to right; right to left.

Example

1----------10

20----------11

21----------30

40----------31

41----------50

Each 7-1/2' section will be assigned a number. If an area is also covered by a 15' map, an additional map number will be assigned to it according to this rule. The 15' map is ignored while numbering the row containing its top two 7-1/2' sections. When the lower 7-1/2' sections of the map are reached the 15' map is assigned the map number, then each of the botton 7-1/2' sections of the map is assigned a number.

Areas depicting 7-1/2' maps will be numbered in red pencil; those depicting 15' maps will be numbered in blue pencil. This will make it clear which numbers pertain to the 15' map. In the example, the 15' map numbers are in parenthesis.

3. Map names should now be keyed to their code numbers of a map order form. The map order form lists the map names in alphabetical order. Listing the map numbers on this form will aid in placing the actual number on each quad map, and will also serve as a quick reference. This should be accomplished by working from the map index to the order form and not vice versa. Start with map number 1, look up its names on the map order form and write the map number beside the map name on the order form. Proceed in numerical order across the map index.

4. Place the assigned map number on each quad map.

5. If it is necessary to use highway maps or other maps because there are no USGS 7-1/2' or 15' maps covering an area, then partition the map into 7-1/2' quads and number as you would 7-1/2' quads.

ITEM 7 - UTM ZONE (Col.18)

Universal Transverse Mercator (UTM) Zone is found in the lower right-hand corner of maps published since 1943. Older maps may not show the UTM Zone. In those cases the interpreter must refer to the longitude of the map corners and the following table.

UTM ZONE	LONGITUDE	UTM CODE
13	102^{o}-108^{o}	3
12	108^{o}-114^{o}	2
11	114^{o}-120^{o}	1

The UTM Zone will be entered on the Map Coordinate Sheet. The UTM Zone will then be preprinted on the Map Point Classification

ITEM 8 - EASTING UTM (Cols. 20-23)

The Easting Universal Transverse Mercator (UTM) for each of the 4 corners of the map is coded to the nearest 100 meters onto the Map Coordinate Sheet. The UTM coordinates for a set of sample points covering the approximate map area are then preprinted onto the Map Point Classification Sheet by means of computer printout taped onto the sheets.

ITEM 9 - NORTHING UTM (Cols. 25-29)

The Universal Mercator (UTM) Northing for each of the 4 corners of the map is coded to the nearest 100 meters onto the Map Coordinate Sheet. The UTM Coordinates for a set of sample points covering the approximate map area are then preprinted onto the Map Point Classification Sheet by means of computer printout taped onto the sheets.

It is necessary to record the correct UTM coordinates with the corresponding consecutive number because that makes each point on the map unique, easily identifiable, and consistently reuseable.

The job of the interpreter is to cross-out coordinates of points which fall off the edges of the map, and to add coordinates of points which may appear on the map but not on the sheet. The interpreter must also associate the correct consecutive number with each UTM coordinate before any data is recorded.

ITEM 10 - (LEAVE BLANK) (Col.30)

The following explanation of elevation, shape, and aspect will also contain the codes which will be recorded on the Map Point Classification Sheet.

ITEM 11. ELEVATION (Cols. 31-33)

After the sample point has been located on a USGS quad map, record its elevation to the nearest 100 feet.

Example:

Elevation in feet	Code
1,820	018
8,000	080
200	002
*1,550	016
*1,450	014

*Note: If even - round down

If odd - round up

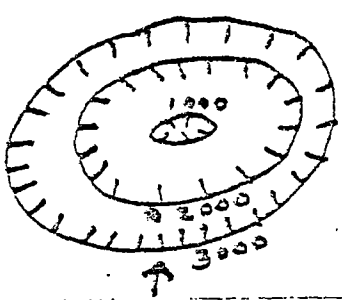
Elevation is shown on USGS maps by brown contour lines which connect points of the same elevation. Every 5th contour line is wider and darker, and occasionally broken to show the elevation it represents in numbers. All points along a contour line would be at the same elevation.

Gaps between the lines indicate changes in elevation. This change is known as a contour interval. How much the elevation changes between lines varies from map to map. If the contour interval is 20 feet, then going from one line to the next indicates an elevation change of 20 feet.

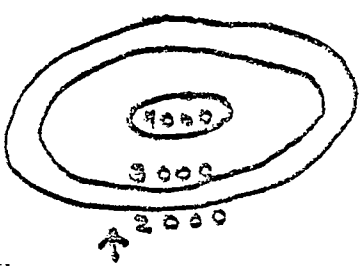
The problem is how to determine whether the next line is an increase or decrease in elevation. There are several ways to determine this.

A. Look for the next numbered elevation line. If it is greater, then the elevation increases and you are going uphill. If it is smaller, then the elevation decreases and you are going downhill.

B. Contour lines cannot have an end on the map; they must either commence and end off the map or close on themselves. If a contour line closes on itself, it represents either a hill or a depression. A depression contour line has small marks on its lower edge, and the elevation decreases toward the center of the concentric lines. Conversely on a hill, the elevation increases toward the center of the concentric lines.



DEPRESSION



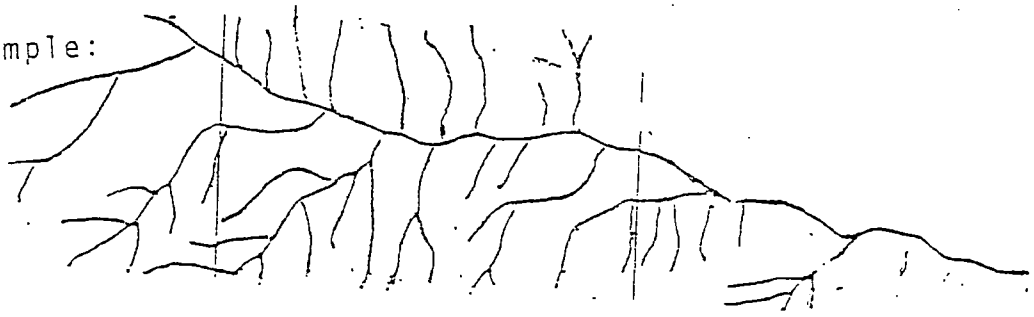
HILL

C. Contour lines crossing streams look somewhat like arrowheads and point upslope towards higher elevation.

D. Water runs from points of higher elevation to points of lower elevation making stream patterns good indicators of relative elevations.

If you see a blue stream line appearing abruptly in the middle of a map, the stream is originating on a hillside, and any other point along that stream will be lower in elevation than the point of origin. Streams also tend to get larger and join together at lower elevations.

Example:



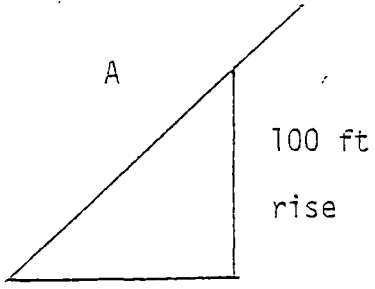
The right side is lower. The streams originate on the hillside and join together into a river bottom.

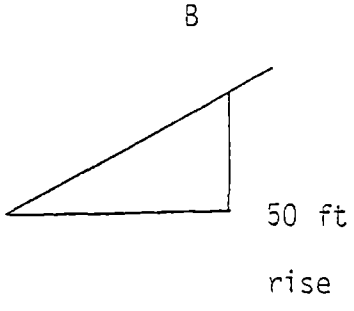
(For some better illustrations concerning elevation, aspect, and slope--refer to Appendix I; Chapter 6 of The Department of the Army Field Manual FM 21-26 MAP READING)

ITEM 12 - (LEAVE BLANK) (Col. 34)

ITEM 13 - SLOPE (Col. 35)

Slope measures the steepness of the land. It tells you how much the elevation has changed over how short a distance. Which of these has a greater slope?





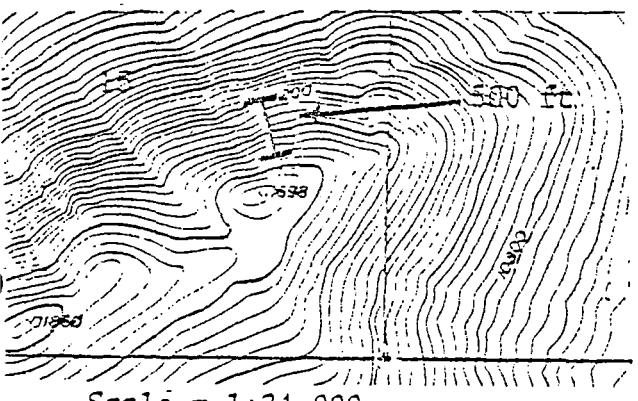
A has the greater slope, and this can be determined mathematically by dividing the rise in elevation over the run in distance.

$$\text{Slope\%} = \frac{\text{Rise}}{\text{Run}} \times 100$$

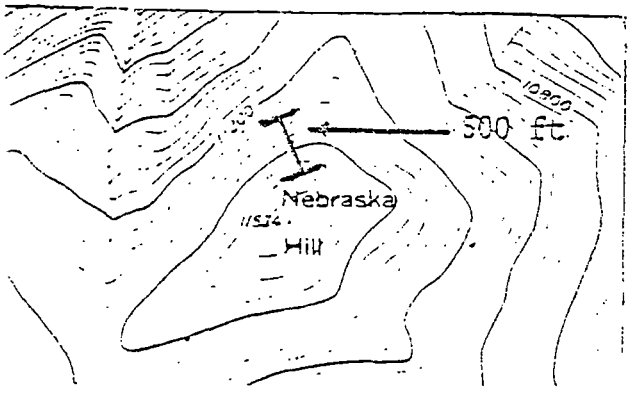
$$A = \frac{100}{100} \times 100 = 100\% \text{ slope}$$

$$B = \frac{50}{100} \times 100 = 50\% \text{ slope}$$

Which of these hills has the greater slope?



Scale = 1:24,000
Contour Interval = 40 ft.
A



Scale = 1:24,000
Contour Interval = 40 ft.
B

Again A has the greater slope, because its rise in elevation is greater over the same run distance of 500 feet.

Slope is always measured DOWNHILL i.e., from a higher elevation to a lower elevation.

In order to determine slope, you need to know two things:

1. Map Scale
2. Contour interval

Map Scale is needed so you can translate map distance (in inches) to ground distance (in feet). The contour interval must be known in order to determine the rise in elevation. You will be using maps of two scales.

7-1/2' quad 1 - 24,000

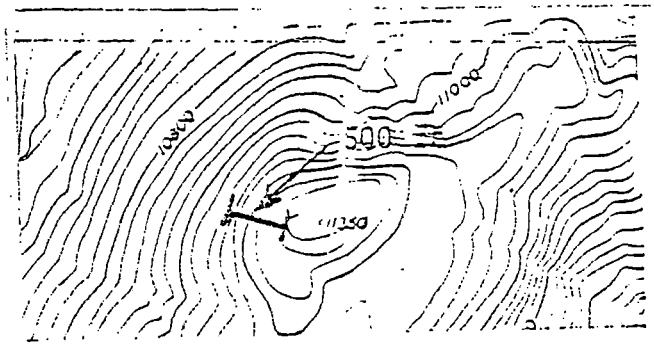
15' quad 1 = 62,500

On a 7-1/2' USGS map the elevation change should be measured over a ground distance of 500 feet. This is a distance of 1/4-inch on the map. This distance can be determined on the map by using a ruler or a photo scale protractor. The measuring scale should be positioned along the course that water would take.

The next step is to count the number of contour lines which are crossed in this 1/4 inch. The number of contour lines times the contour interval will give you the change in elevation (rise).

For example, if you cross 5 lines on a map with a contour interval of 40 feet, the change in elevation would be 5 X 40 = 200 feet. The slope percent is:

$$\frac{\text{Rise}}{\text{Run}} \times 100 = \frac{200}{500} \times 100 = 40\%$$



On the Map Point Classification Sheet we do not record the precise slope percent, rather, we record slope by 9 slope classes. The slope classes are:

Slope Percent	Code
0 - 7	0
8 - 15	1
16 - 23	2
24 - 31	3
32 - 39	4
40 - 47	5
48 - 55	6
56 - 63	7
64 - 71	8
72+	9

The slope coded corresponds exactly to the number of lines crossed within 500 feet ground distance on a 7-1/2' map with a 40 foot contour interval or within 1,000 feet ground distance on a 15' map with an 80 foot contour.

The following tables show how slope codes relate to number of lines crossed at different contour intervals:

7-1/2' MINUTE MAP - 5 FOOT CONTOUR INTERVAL

Number of Lines Crossed	Slope Code
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	1
9	1
10	1
11	1
12	1
13	1

7-1/2 MINUTE MAP - 10 FOOT CONTOUR INTERVAL

Measure 500 Feet Horizontal (1/4 inch)

Number of Lines Crossed	Slope Code	Number of Lines Crossed	Slope Code
0	0	22	5
1	0	23	5
2	0	24	6
3	0	25	6
4	1	26	6
5	1	27	6
6	1	28	7
7	1	29	7
8	2	30	7
9	2	31	7
10	2	32	8
11	2	33	8
12	3	34	8
13	3	35	8
14	3	36+	9
15	3		
16	4		
17	4		
18	4		
19	4		
20	5		
21	5		

7-1/2 MINUTE MAP - 20 FOOT CONTOUR INTERVAL

Measure 500 Feet Horizontal (1/4 inch)

Number of Lines Crossed	Slope Code
0	0
1	0
2	1
3	1
4	2
5	2
6	3
7	3
8	4
9	4
10	5
11	5
12	6
13	6
14	7
15	7
16	8
17	8
18+	9

7-1/2 MINUTE MAP - 25 FOOT CONTOUR INTERVAL

Number of Lines Crossed	Slope Code
0	0
1	0
2	1
3	1
4	2
5	3
6	3
7	4
8	5
9	5
10	6
11	6
12	7
13	8
14	8
15+	9

7-1/2 MINUTE MAP - 40 FOOT CONTOUR INTERVAL

Measure 500 Feet Horizontal (1/4 inch)

Number of Lines Crossed	Slope Code
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9+	9

7-1/2 MINUTE MAP - 50 FOOT CONTOUR INTERVAL

Number of Lines Crossed	Slope Code
0	0
1	1
2	2
3	3
4	5
5	6
6	7
7	8
8+	9

7-1/2 MINUTE MAP - 80 FOOT CONTOUR INTERVAL

Number of Lines Crossed	Slope Code
0	0
1	2
2	4
3	6
4	8
5+	9

15 MINUTE MAP - 10 FOOT CONTOUR

Measure 1,000 Feet Horizontally (approx. 1/5 inch)

Number of Lines Crossed	Slope Code
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	2
17	2

15 MINUTE MAP - 20 FOOT CONTOUR INTERVAL

Measure 1,000 Feet Horizontally (approx. 1/5 inch)

Number of Lines Crossed	Slope Code
0	0
1	0
2	0
3	0
4	1
5	1
6	1
7	1
8	2
9	2
10	2
11	2
12	3
13	3
14	3
15	3
16	4
17	4
18	4
19	4
20	5
21	5
22	5
23	5
24	6
25	6
26	6
27	6
28	7
29	7
30	7
31	7
32	8
33	8
34	8
35	8
36+	9

15 MINUTE MAP - 25 FOOT CONTOUR INTERVAL

Number of Lines Crossed	Slope Code
0	0
1	0
2	0
3	1
4	1
5	1
6	1
7	2
8	2
9	2
10	3
11	3
12	3
13	4

15 MINUTE MAP - 40 FOOT CONTOUR INTERVAL

Measure 1,000 Feet Horizontally (approx. 1/5 inch)

Number of Lines Crossed	Slope Code
0	0
1	0
2	1
3	1
4	2
5	2
6	3
7	3
8	4
9	4
10	5
11	5
12	6
13	6
14	7
15	7
16	8
17	8
18+	9

15 MINUTE MAP - 50 FOOT CONTOUR INTERVAL

Measure 1,000 Feet Horizontally (approx. 1/5 inch)

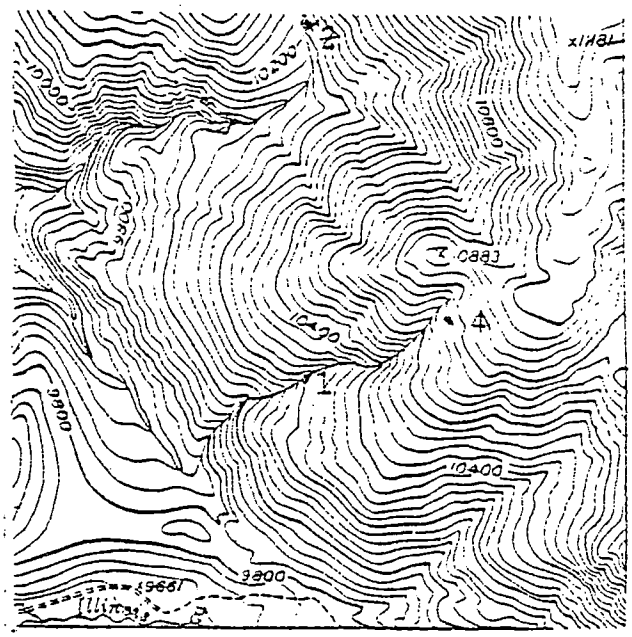
Number of Lines Crossed	Slope Code
0	0
1	0
2	1
3	1
4	2
5	3
6	3
7	4
8	5
9	5
10	6
11	6
12	7
13	8
14	8
15	9
16+	9

15 MINUTE MAP - 80 FOOT CONTOUR INTERVAL

Measure 1,000 Feet Horizontally (approx. 1/5 inch)

Number of Lines Crossed	Slope Code
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9+	9

Examples



7½' Map
Scale 1:24,000
Contour Interval 40 feet

STREAMS

PT. 1 - Falls in Stream

Take scale and arrange it so that one end of the scale is on this point and the other end is downhill. In this case the scale should be running along with (parallel to) the stream. Count the number of brown contour lines that fall between the 0 and 500' marks.

How many lines do you count?

What would your slope code be?

PT. 2 - Falls in Stream

The same procedure is followed as for point 1.

How many contours do you count?

What is your slope code?

PT. 3 - Falls on hillside close to stream.

Place your scale so that one end is on the point and the other is downhill. Now you want to measure, perpendicular (at right angles, 1) to the contour lines using the stream as a barrier on one side. Should the scale cross the stream and go up the other side you must move the scale so the lower end goes no farther than the stream. This would mean the upper end of this scale would now be higher than the point. The scale should still intersect the point. If this adjustment was not used you would end up measuring the same contour line twice. The number of lines that fall between the two ends of the scale should then be counted.

How many contours did you count?

What is the slope code?

PT. 4 - Falls on hillside close to stream.

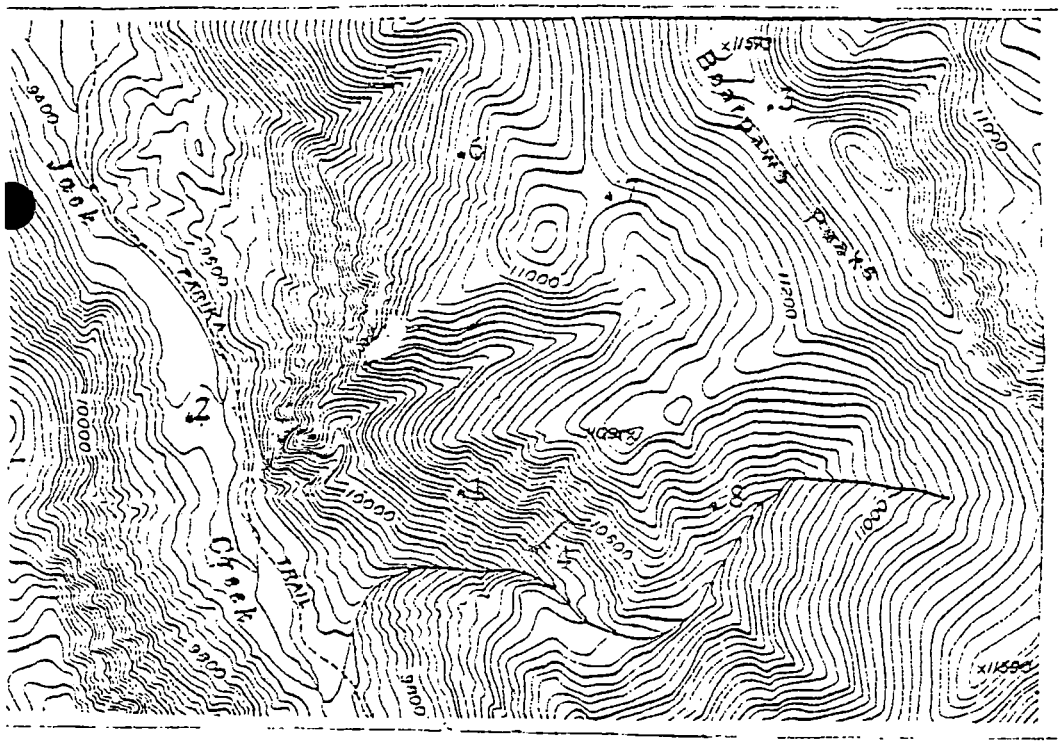
Do this point in the same manner as point 4.

How many contours did you count?

What is the slope code?

** Remember - <u>you do not want to measure across streams, nor over ridges--either method could lead to counting the same contour line more than once.</u>

EXAMPLES



7½' MAP
SCALE 1:24000
CONTOUR INTERVAL
40 FEET

OTHER TERRAIN

Procedures for these points are the same as for the streams--go downhill.

- don't cross lines twice
- do measure perpendicular to closest line

PT. 1 - Falls on steem hillside

Place the scale so one end is on the point and the other end is downhill.

How many lines do you count within your 500' contour interval?

What is the slope code?

PT. 2 - Falls in flat area

Procedures the same as point 1.

How many contours do you count?

What is the slope code?

PT. 3 - Falls in what is called a "saddle" i.e., a ridge that lies between two summits or peaks.

Here a little judgement must be used.

Would you measure to the left (west) of the point or to the right (east) of the point? Perhaps the best estimate would be to go towards the closest contour line. Put one end mark on the point and the other down slope. Count the number of lines that fall between the interval, still remaining as perpendicular to the contour lines as possible.

How many lines do you count?

What is the slope code?

PT. 4 - Falls on hillside

Here we have a situation where the scale will cross a stream, thus you would have been counting the same line twice. The scale should be adjusted uphill so the lower end of the scale is in the stream bottom.

How many lines do you count?

What is the slope code?

PT. 5 - Falls on hillside

Procedure is similar to pt. 4.

How many contour lines do you count?

What is the slope code?

Do points 6, 7, and 8 the same way.

How many contour lines do you count for 6, 7 and 8?

What are their respective slope codes?

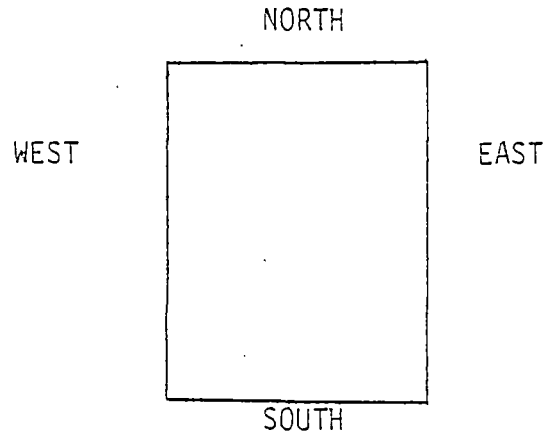
Answers to all exercises are found in Appendix II.

ITEM 14 - (LEAVE BLANK) (Col. 36)

ITEM 15 - ASPECT (Col. 37)

Aspect refers to the direction of slope. It is to be recorded on the Map Point Classification Sheet. A hillside with a northern aspect means that the hillside faces to the north. Aspect is important for land managers to know because soils on north slopes generally are sheltered from the sun, remain moist, and enable trees to grow better than on south facing slopes.

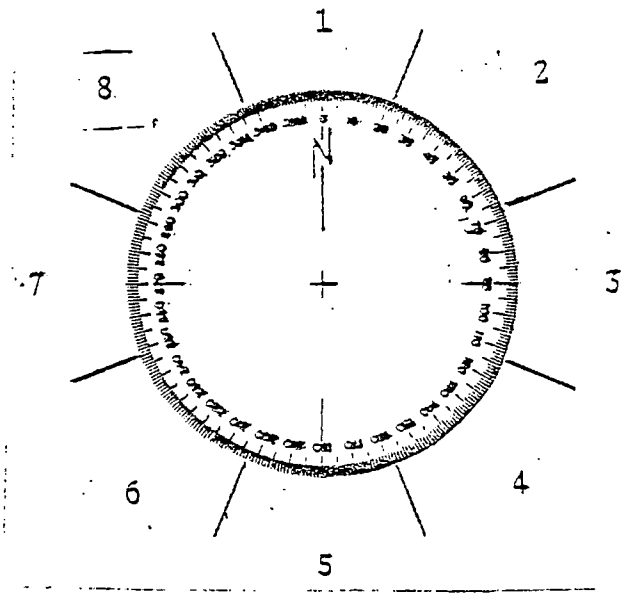
To determine aspect from a map, remember that the top of the map is north, the bottom of the map is south, the left side of the map is west, and the right edge of the map is east.



The contour lines must be studied to visualize the shape of the land they represent. Aspect is easiest to determine by imagining a line drawn perpendicular (at right angles) to the contour lines from the top of the hill to the bottom. (This is the same line you would have determined your slope from). An arrowhead placed on the line near the bottom of the hill points toward the aspect.

Aspect is recorded using the following codes:

Aspect	Code	Corresponding Degrees
Level	9	0
N	1	337° - 23°
NE	2	23° - 68°
E	3	68° - 113°
SE	4	113° - 158°
S	5	158° - 203°
SW	6	203° - 248°
W	7	248° - 293°
NW	8	193° - 337°



When you record a slope of 0 - you must record the corresponding aspect of 9! Also if you record an aspect of 9 you must record a slope of 0!

VII.

To classify grid points according to OWNERSHIP, RESERVED AREA, UNIQUE ZONE, RAINFALL, REGION, FOREST, WORKING CIRCLE, WILDLIFE, WATERSHED ZONE, SOIL, OR RECREATION INFLUENCE ZONES, these categories must be delineated (mapped) on the USGS quad maps or on base maps onto which grid points may be visually transferred from USGS quad maps. Some categories are obtained already mapped (such as watershed zones), and are then transferred to quad maps or overlays. Sometimes the originally obtained map is used to visually transfer the grid point without physically transferring the zones onto a quad map.

ITEM 16 - (LEAVE BLANK) (Col. 38)

The following defines the ownership categories to be mapped. The respective codes for these ownerships are found in the appendix.

ITEM 17 - OWNERSHIP (Cols. 39-40)

Census Water.--Water, as classified by the Bureau of the Census, is streams, sloughs, estuaries, and canals more than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds more than 40 acres in area.

National Park Service lands.--Lands administered by the National Park Service such as National Parks, National Monuments, National Historic Sites (such as National Memorials, and National Battlefields) and some National Recreation Areas. In Idaho these include Yellowstone National Park, Nez Perce National Monument, and Craters of the Moon National Monument.

National Forest lands.--Lands administered by the USDA Forest Service such as National Forests, National Grasslands, and some National Recreation Areas. (Including Curlew National Grassland, Sawtooth and Hell's Canyon NRA).

Bureau of Land Management--Federal lands administered by the Bureau of Land Management.

Indian (BIA).--Indian lands held in trust such as Indian Reservations. In Idaho the four Indian Reservations are Nez Perce, Coeur d'Alene, Fort Hall and Duck Valley.

Miscellaneous Federal lands--Land in Federal ownership administered by federal agencies other than the Forest Service, BLM, BIA, or the National Park Service. Miscellaneous Federal lands would include such lands as those administered by the Bureau of Reclamation, the USDA Fish & Wildlife Service, military reservations, lands other than "Indian, held in trust," and DOE (National Reactor Testing Station).

State lands.--Lands in state ownership, such as State Parks, State grazing lands, state game refuges, state endowment land, state waterfowl preserves, state recreation areas, and miscellaneous state lands. Also lands leased by the state for 50 years or more. The state endowment lands which have been color coded light blue with red slash marks will have a reserve code of 9.

County and Municipal lands.--Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more. Includes such things as city parks, county landfills, and sewage treatment sites.

Forest Industry lands.--Lands owned by companies or individuals operating wood-using plants such as: Diamond International, Bennett Lumber Products, Inland Empire Paper, Boise Cascade, Potlatch Forests, Louisiana Pacific, Idaho Forest Industries.

Farmer-owned lands.--Lands owned by farm (ranch) operators Excluded are lands leased by farm operators from nonfarm owners). A farm operator is a person who operates a farm, either doing the work himself or directly supervising the work. A farm is a place operated as a unit of 10 or more acres from which the sale of agricultural products totals $50 or more annually or a place operated as a unit of less than 10 acres from which the sale of agricultural products for a year amounts to at least $250. Places having less than the $50 to $250 minimum estimated sales in a given year are also counted as farms if they can normally be expected to produce products in sufficient quantity to meet the requirement of the definition.

That's the complete definition. However, there are still grounds for confusion. For instance, we have an ownership category of Miscellaneous Private, Corporate. A farmer (rancher) who incorporates himself (or his family) is probably farmer-owned. A large ranch owned by the Mighty Poor Oil Corporation leased to the Jimmy Dean Sausage, Land, and Cattle Company would be corporate.

Other Private-Corporate.--Lands in corporate ownership that are not forest-industry or farmer owned lands. (May include lands owned by Indian tribes.)

Other Private-Individual.--Privately owned lands other than forest-industry, farmer-owned, and other private corporate. (Includes lands owned by individuals or groups of Indians).

ITEM 18 - (LEAVE BLANK) (Col. 41)

ITEM 19 - RESERVED AREA (Col. 42)

Reserved land is land reserved from timber utilization through statute or administrative designation.[4] Such lands should be identified and mapped or listed during the mapping phase. Some reserved lands may not be identified until the ownership classification is made. (See RESERVED AREA code list for categories of reserved areas).

4

Land which has been withdrawn through administrative designation for which there exists a written document(s) which virtually prohibits management of land for the production of timber products (not merely controlling timber harvesting methods) and carries the weight of legal authority. Such authority is usually vested in a public agency, department, etc.; and supersedes rights of ownership. The prohibition against management for timber products cannot be changed through decision of the land manager or through a change in land management personnel, but is rather permanent in nature.

Land such as municipal watersheds, greenbelts, and game preserves are previously encountered examples of land withdrawn through administrative written document(s) such as described above.

ITEM 20 - UNIQUE ZONE (Cols. 43-44)

Each individual Reserved Area is recorded as a Unique Zone and should be noted when mapped. Also, there may be additional Unique Zones (not reserved)--see RESERVED AREA CODES for a more complete explanation of UNIQUE ZONE and see UNIQUE ZONE CODES for the areas to be noted on the base maps.

ITEM 21 - (LEAVE BLANK) (Col. 45)

ITEM 22 - RAINFALL (Cols. 46-47)

Transfer the Rainfall onto whatever map is appropriate. The USGS Index map can be used. This allows the map point classifer to determine which USGS Quad maps have lines running through them. The classifer must then determine as best he can "where" on the USGS quad map the line goes.

ITEM 23 - REGION (Col. 48)

Under Region, Forest Service Region, BLM Resource Areas, or BIA Areas will be recorded depending on the ownership at that sample point.

National Forest lands will either fall in the Northern Region or the Intermountain Region. The Region corresponds to the Forest which will be mapped.

For BLM ownership, BLM resource areas will be coded under Region, and they will be mapped.

For BIA ownership, BIA Areas will be coded under Region, and they are directly related to the reservations which will be found on the ownership maps. (See Appendix).

ITEM 24 - FOREST (Cols. 49-50)

National Forests, BLM districts, and Indian Reservations must be mapped on the USGS quad maps, or have the necessary points relocated on the ownership maps. Also, the "alienated" lands within their boundaries must be mapped. BIA agencies are not mapped, but are listed according to the Reservations pertaining thereto (See Appendix for REGION, FOREST, WORKING CIRCLE for BIA ownership). National Forest maps have been obtained from the appropriate Regional Office, (these maps include delineations of alienated land). BLM maps showing district boundaries may be obtained from the appropriate BLM State Office (but must be updated at county courthouses for actual ownership within the districts). BIA Reservation maps may be acquired from the appropriate BIA agency but usually the Reservation boundaries and "alienated" lands are updated on the ownership base maps. All lands not NFS, BLM or BIA receive code 99.

ITEM 25 - WORKING CIRCLE (Cols. 51-52)

Working Circles for National Forests need not be mapped. The National Forests in Idaho are all coded 02. BLM SYU's and S&P Working Circle boundaries are shown on the maps furnished. BIA Reservations are updated on the ownership base maps.

ITEM 26 - WILDLIFE (Cols. 53-54)

Transfer the map delineations of the game management units and their respective codes from the map supplied by the Idaho Dept. of Fish and Game onto the USGS quad map index, and where necessary, individual USGS quads.

ITEM 27 - STATE SUPERVISORY AREAS (Col. 55)

Each point will be coded according to the state supervisory area within which it is included. The boundaries of the supervisory areas will be obtained from the state inventory reports in our files and transferred to the U.S.G.S. quad map index. It may be necessary to put some boundaries on individual U.S.G.S. quads for precision.

ITEM 28 - WATERSHED ZONE (Cols. 56-60)

Transfer the U.S.G.S. quad boundaries onto the watershed zone map. Record the code as shown on the map.

ITEM 29 - SOIL (Cols. 61-63)

Printed maps with soils delineated on them have been obtained. We will probably use it directly without transferring the soils delineation to other base maps. The coding will be the same as that shown on the soils map and described in the legend.

ITEM 30 - INTERPRETER (Cols. 64-65)

The data recorder will record their assigned interpreter code in these columns.

ITEM 31 - INFLUENCE ZONES (Cols. 67-75)

Influence zones that affect land use or management will be delineated on the USGS quad maps. Presently, 9 categories of influence zones are recognized. This information will be obtained from the ownership maps, road maps, the quads, AMS, F.S. and BLM maps.

1. Perennial Streams. Zones will be delineated parallel to the course of the perennial streams 200 feet on each side.

2. Ski Areas. Zones will be delineated within a radius of 5 miles from center of developed or proposed ski areas.

3. Major Highways and Roads. Zones will be delineated parallel to the course of the highways 1/2 mile on each side.

4. Rivers. Zones will be delineated parallel to the course of rivers 1/2 mile on each side.

5. Lakes. Zones will be delineated with a radius of 2 miles from the edge of lakes 200 acres or larger and 1/2 mile for smaller lakes.

6. Metropolitan Centers. Zones will be delineated around towns and cities commensurate with the present populations of the towns.

POPULATION	RADIUS IN MILES
100,000 +	25
50,000 - 99,999	15
29,000 - 49,999	10
5,000 - 28,999	5
500 - 4,999	2

7. National Parks and Monuments and State Parks. Zones will be delineated within a radius of 2 miles of boundaries of State Parks, National Parks and Monuments.

8. Private Hunting Preserves. The boundary of the preserve itself.

9. State or Federal Game or Waterfowl Preserves. In government ownership and managed for game production. Zones will be delineated within a radius of 1 mile from the boundary of the preserve.

XII. MPC DATA ITEMS SUMMARY

A. All Map Points

The following information will be recorded for each sample point:

Item No.	Col.	Item	Code
1	1 - 2	State	16
3	4 - 6	County	1/
4	7	Congressional District	1 or 2
5	8 - 11	Consecutive Point Number	1/
6	13 - 16	Map Number	2/
7	18	UTM Zone	2/
8	20 - 23	Easting UTM	2/
9	25 - 29	Northing UTM	2/
17	39 - 40	Ownership	1/
19	42	Reserved Area	1/
23	48	Region	
		State & Private Ownership (inc. NPS, Census Water, Misc. Federal, County & Municipal, Misc. State & Private)	0
		National Forest Ownership (Region)	1 or 4 (See code list in Appendix)
		BLM Ownership (Resource Area)	1/
		BIA Ownership (Area)	7 or 8 (See code list in Appendix)

1/ Record the appropriate code from code lists in Appendix.

2/ Preprinted.

Item No.	Col.	Item	Code
24	49 - 50	Forest	
		National Forest Ownership - by Forest	1/
		BLM Ownership - by district	1/
		BIA Ownership - by agency	1/
		State & Private Ownership (inc. NPS & Census Water, Misc. Federal, State, Private, County & Municipal)	99
25	51 - 52	Working Circle	
		National Forest Ownership	All National Forest land, code 01 for W.C.
		BLM Ownership - by SYU	1/
		BIA Ownership - by reservation	1/
		State & Private Ownership (inc. NPS & Census Water, Misc. Federal, State, Private, County & Municipal)	2/
27	55	State Supervisory Area	1/
30	64 - 65	Interpreter No. is always recorded using the code assigned to the individual.	
31	67 - 75	Influence Zones	0 - Consecutive point not in zone
			1 - Consecutive point within zone

1/ Record appropriate code from code lists in Appendix.

2/ For these ownerships, the working circles will correspond with the County groups. See map and codes in Appendix.

In summary, the following descriptions will be recorded for each point: Map number, consecutive number, UTM Zone code, the two UTM coordinates, the interpreter code, and the 9 variables listed below.

OWNER CATEGORY

Item No.	Data Form Column		S&P (All codes other than 11, 12, 13)	NFS Code 11	BLM Code 12	BIA Code 13
1	1 - 2	State	16	16	16	16
3	4 - 6	County	*	*	*	*
4	7	Cong. District	*	*	*	*
17	39 - 40	Ownership	*	11	12	13
19	42	Reserved Area	*[3/]	9	*[3/]	*[3/]
23	48	Region	0	1 or 4	Resource Area*	Area*
24	49 - 50	Forest	99	Forest*	District*	Agency*
25	51 - 52	Working Circle	01, 02, 03	01	SYU*[4/]	Reservation*
27	55	State Supervisory Area	*	*	*	*

*See code lists in Appendix.

[3/] Code 9, if inventoried.

[4/] If inventoried by BLM, record the SYU code. If not in an SYU, code 00.

B. Points Not Previously Inventoried

For those points that are not coded 9 (previously inventoried land) in Col. 42 (Reserved Area), and not coded 1 (Census Water) in Col. 39-40 (Ownership), record the following data items in addition to the items previously recorded:

Item No.	Col.	Item
11	31 - 33	Elevation
13	35	Slope
15	37	Aspect
20	43 - 44	Unique Zone
22	46 - 47	Rainfall
26	53 - 54	Wildlife
28	56 - 60	Watershed Zone
29	61 - 63	Soil
31	67 - 75	Influence Zone

APPENDIX

This Appendix contains code lists for Data Items with the exception of elevation, slope, and aspect, the preprinted items (map number, UTM zone, easting, and northing), watershed and soil which are taken directly from their respective maps, and interpreter which will be assigned to the individual.

OWNERSHIP CODES

01	Census Water
09	National Park Service
11	National Forest
12	BLM
13	Indian, trust (BIA)[1/]
14	Misc. Federal
15	State
16	County and Municipal
20	Forest Industry
40	Farmer
60	Private Corporate
70	Private Individual

[1/] This includes only Indian lands held in trust by the federal government, i.e., either tribal lands or lands held in trust for individuals. Indians can own their own land (Code 20, 40, 60, or 70); because the owner is an Indian does not mean code 13 will be assigned. Also, federal lands administered by BIA are given code 14.

CONSECUTIVE POINT NUMBER

The consecutive point number is found on the map adjacent to each grid point, and is unique to each grid point within the boundary of a map.

WILDLIFE

Each game management unit is assigned one of the following codes:

CODE	GAME MANAGEMENT UNIT
* 01-78	1-78
79	8A
80	9A
81	10A
82	11A
83	16A
84	19A
85	20A
86	21A
87	27A
88	30A
89	32A
90	36A
91	36B
92	37A
93	59A
94	62A
95	66A
96	68A
97	73A

RESERVED AREA CODES

1 - Not reserved or inventoried, and census water

2 - USDA Fish & Wildlife Service - all areas administered

3 - National Park Service - all areas administered

4 - Wilderness, primitive, wild scenic rivers

5 - State reserves (State Parks, Wildlife Management Areas)[1/]

6 - Reserved watersheds & other local reserves

7 - NRA's or other special recreation areas

8 - Military reservations

9 - Inventoried areas - usually by NFS, BIA, BLM or the State Division of Lands.

UNIQUE ZONE CODES

Unique zone is also recorded as an individual code designated for each specific reserved area. A list of unique zone codes for Idaho is included in the code list section of these procedures.

Unique Zone can also be used to designate areas with special management constraints, or zones for transportation or access. When a unique zone is not a reserved area, the reserved area code (Item 18) is coded 1. Unique zone is also coded for lands not reserved falling within the boundaries of reserved areas. In this situation, the unique zone code for the reserved area is recorded (see code list for specific unique zone codes).

[1/] Code 5 will probably not be used in Idaho because neither the State Parks nor the Wildlife Areas are legally or administratively reserved from timber harvesting.

UNIQUE ZONE CODES

01 Lands within NFS boundaries that are not administered by NFS.
02 Lands within Indian reservation boundaries that are not ownership code 13.
03 Yellowstone National Park
04 Craters of the Moon National Monument
05 Nez Perce National Monument
06 Deer Flat National Wildlife Refuge
07 Camas National Wildlife Refuge
08 Bear Lake National Wildlife Refuge
09 Gray's Lake National Wildlife Refuge
10 Minidoka National Wildlife Refuge
11 Hell's Canyon National Recreation Area
12 Sawtooth National Recreation Area
15 U.S. Sheep Experiment Station
16 National Reactor Testing Station (Also called Idaho National Engineering Lab)
17 Mountain Home Precision Bombing Range
18 Mountain Home Air Force Base Gunnery Range
19 Mountain Home Air Force Base
20 Saylor Creek Aerial Gunnery Range
21 Priest Lake State Park
22 Bruneau Dunes State Park
23 Indian Rock State Park
24 Heyburn State Park
25 M.M. McCroskey State Park
26 Farragut State Park
27 Ponderosa State Park
28 Round Lake State Park
29 Winchester State Park
30 Old Mission State Park
31 Hells Gate State Park
32 Packer John State Park
33 Veteran's Memorial State Park
34 Lucky Peak State Park
35 Three Island State Park
36 Malad Gorge State Park
37 Massacre Rock State Park
38 Bear Lake State Park
39 Harriman Ranch State Park
40 Henry's Lake State Park

50 McArthur Lake (State) Wildlife Management Area
51 Pend Oreille (State) Wildlife Management Area
52 Coeur d'Alene (State) Wildlife Management Area
53 St. Marie's (State) Wildlife Management Area
54 Spring Valley Lake (State) Wildlife Management Area
55 Craigmont (State) Wildlife Management Area
56 Horse Thief Lake (State) Wildlife Management Area
57 Fort Boise (State) Wildlife Management Area
58 C.J. Strike Reservoir (State) Wildlife Management Area
59 Hagerman (State) Wildlife Management Area
60 Niagara Springs Ranch (State) Wildlife Management Area
61 Carey Lake (State) Wildlife Management Area
62 Sterling (State) Wildlife Management Area
63 Mud Lake (State) Wildlife Management Area
64 Market Lake (State) Wildlife Management Area
65 Sand Creek (State) Wildlife Management Area
66 Cartier Slough (State) Wildlife Management Area
67 Tex Creek (State) Wildlife Management Area
68 Portneuf (State) Wildlife Management Area
69 Montpelier (State) Wildlife Management Area

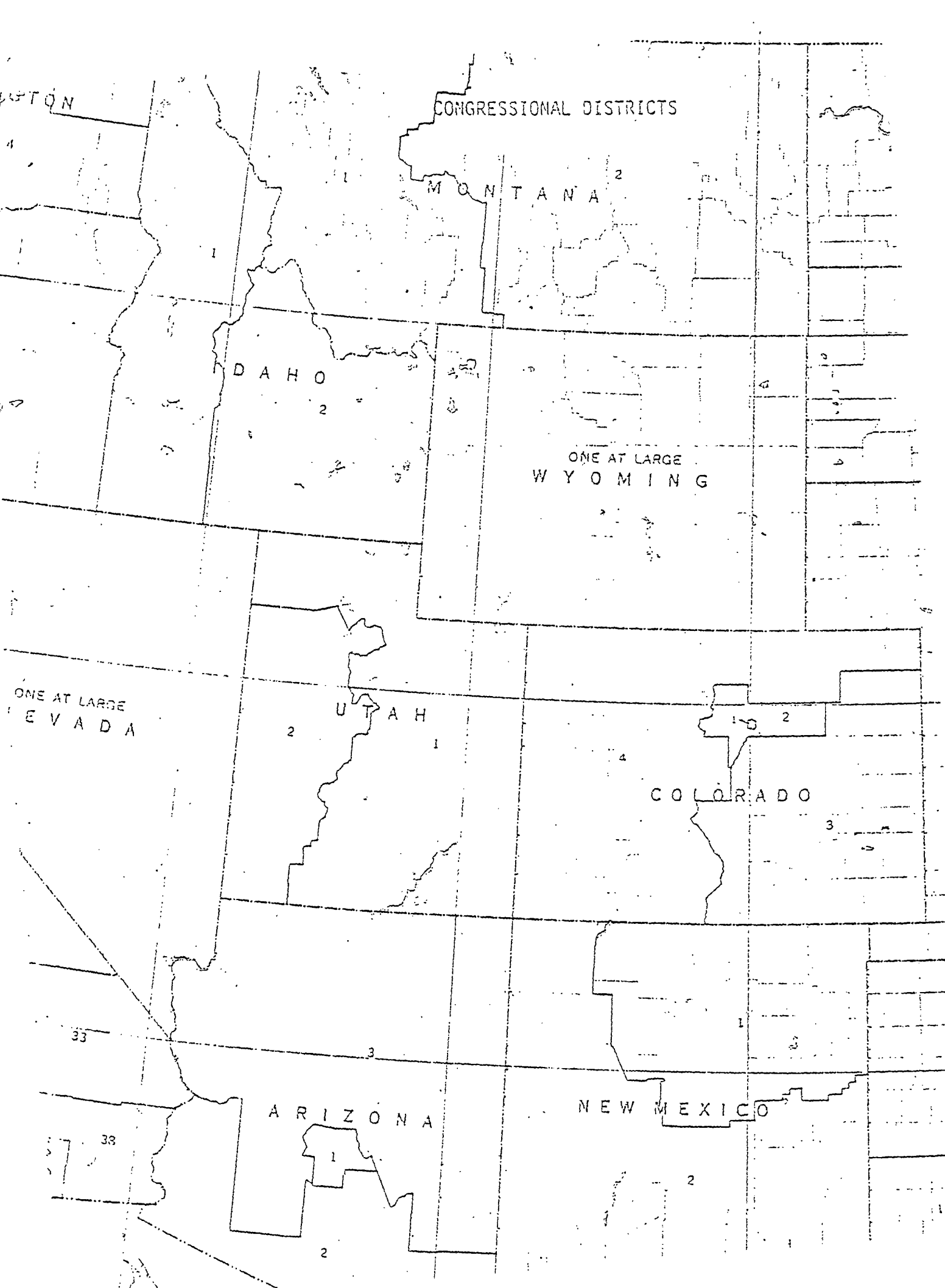
National Park Service administers all National Monuments, owner code 09.

National Wildlife Refuges are considered miscellaneous Federal, owner code 14.

CONGRESSIONAL DISTRICTS

Congressional districts are composed of groups of counties and follow county boundaries. There are two (2) districts in Idaho.

District (Code)	Counties within District	
1	Ada	Idaho
	Adams	Kootenai
	Benewah	Latah
	Boise	Lewis
	Bonner	Nez Perce
	Boundary	Owyhee
	Canyon	Payette
	Clearwater	Shoshone
	Elmore	Valley
	Gem	Washington
2	Bannock	Gooding
	Bear Lake	Jefferson
	Bingham	Jerome
	Blaine	Lemhi
	Bonneville	Lincoln
	Butte	Madison
	Camas	Minidoka
	Caribou	Oneida
	Cassia	Power
	Clark	Teton
	Custer	Twin Falls
	Franklin	
	Fremont	


CONGRESSIONAL DISTRICTS
MONTANA
IDAHO
ONE AT LARGE
WYOMING
ONE AT LARGE
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO

STATE SUPERVISORY AREAS (SSA)

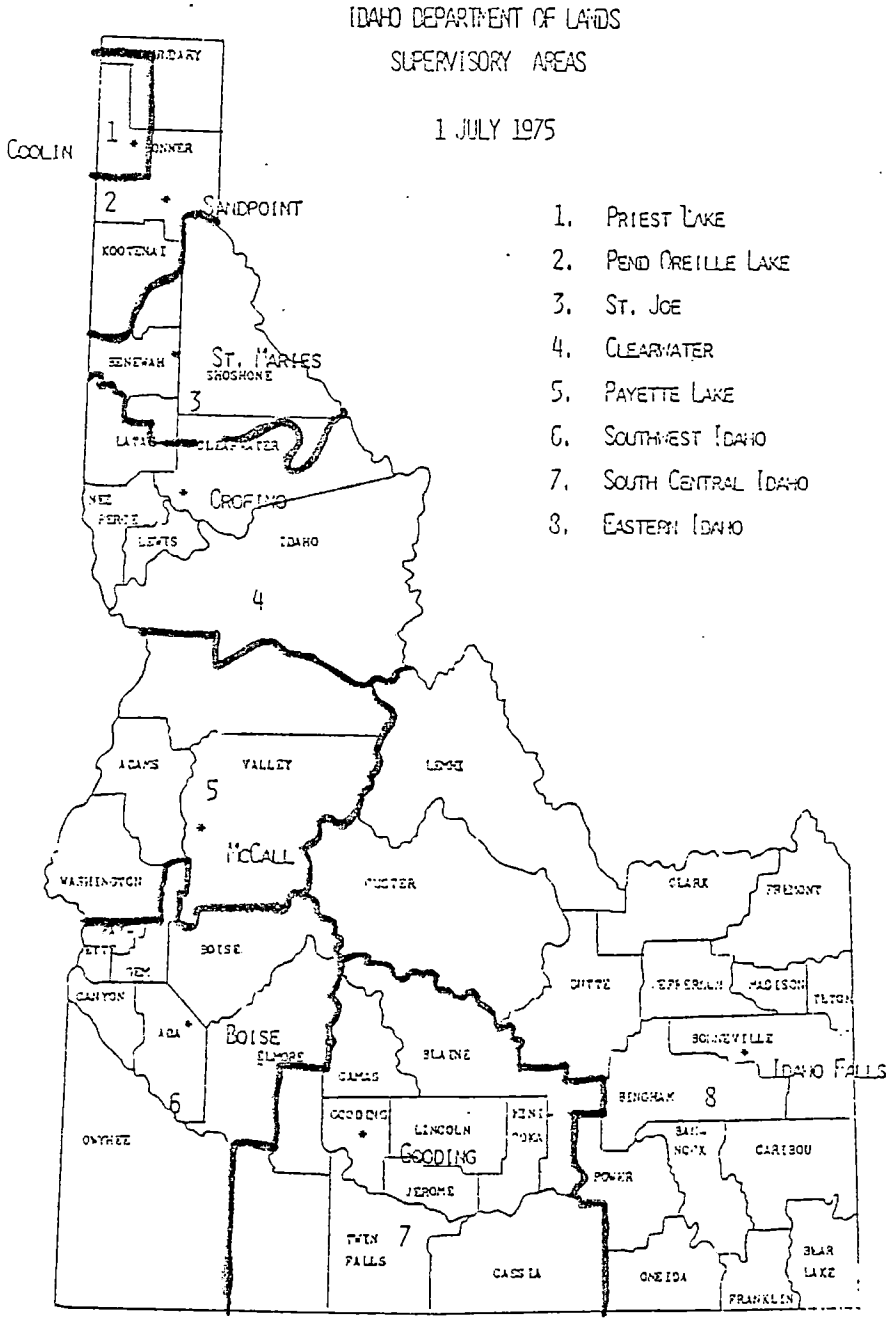
Each point will be recorded according to the Supervisory Area within which it is included.

Code	S.S.A.
1	Priest Lake
2	Pend Oreille
3	St. Joe
4	Clearwater
5	Payette Lake
6	Southwest Idaho
7	South Central Idaho
8	Eastern Idaho

IDAHO DEPARTMENT OF LANDS

SUPERVISORY AREAS

1 JULY 1975



1. PRIEST LAKE
2. PEND OREILLE LAKE
3. ST. JOE
4. CLEARWATER
5. PAYETTE LAKE
6. SOUTHWEST IDAHO
7. SOUTH CENTRAL IDAHO
8. EASTERN IDAHO

REGION, FOREST, WORKING CIRCLE

FOREST SERVICE Ownership Code 11

State--Idaho Code 16

REGION	CODE	FOREST	CODE	WORKING CIRCLE (CODE)
Northern	01	Bitterroot	03	01
		Clearwater	05	01
		Coeur d'Alene	06	01
		Kaniksu	13	01
		Kootenai	14	01
		Nez Perce	17	01
		St. Joe	18	01

State--Idaho Code 16

REGION	CODE	FOREST	CODE	WORKING CIRCLE (CODE)
Intermountain	04	Boise	02	01
		Cache	04	01
		Caribou	05	01
		Challis	06	01
		Payette	12	01
		Salmon	13	01
		Sawtooth	14	01
		Targhee	15	01
		Curlew National Grassland	05	01

REGION, FOREST, WORKING CIRCLE

BUREAU OF LAND MANAGEMENT OWNERSHIP CODE 12

State (16) Idaho

Region (Resource Area)	Code	Forest (District)	Code	W.C. (SYU)[6/]	Code
Cascade	4	Boise	01	Boise	07
Owyhee	5				
Brunean	6				
Jarbridge	7				
Emerald Empire	4	Coeur d'Alene	06	Coeur d'Alene-- Spokane	09
Cottonwood	5				
Magic	4	Burley	02	Central Idaho	11
Raft River	5				
Bannock-Oneida	6				
Big Butte	4	Idaho Falls	03	" "	"
Medicine Lodge	5				
Soda Springs	7				
Pahsimeroi	4	Salmon	04	" "	"
Challis-Mackay	5				
Lemhi	6				
Monument	4	Shoshone	05	" "	"
Bennett Hills	6				

BUREAU OF LAND MANAGEMENT FIELD OFFICES AND INVENTORY UNITS (Gross Boundaries) (STU's)